

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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Serial No. : 10/516,463

PCT Filed : JUNE 9, 2003

PCT No. : PCT/JP2003/007265

For : RUBBER COMPOSITION AND TIRES MADE BY USING THE
SAME

Art Unit & Examiner : 1796, Ms. Vickey Ronesi

DECLARATION UNDER 37 CFR 1.132

ASSISTANT COMMISSIONER FOR PATENTS

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Sir:

I, Noriaki YUKIMURA, in care of 3-1-1, Ogawahigashi-cho Kodaira-shi, Tokyo, Japan, declare that:

1. I graduated from The University of Tokyo in doctor's course of Graduate School of Science majoring chemistry in March 2007, and joined BRIDGESTONE CORPORATION in April 2007. Then, I have been engaged in the research and development of compounding ingredients for rubber compositions in Tire-Material-Development Department up to the present.

2. I am familiar with the subject matter disclosed in the application.

3. Experiment

Object of Experiment

In order to clarify differences of various physical properties between "Example 2 of this invention described in the specification" and "Examples 1, 4 and 5 of Scholl et al." and between "Examples 5, 6 and 7 of this invention described in the specification" and "Examples 2, 6 and 7 of Scholl et al.", the following experiments were conducted.

Procedure of the Experiment

The compounding recipes except for the silane compounds having sulfur atom and the production procedures for the above rubber compositions are the same as Example 1 of this invention described in the specification.

Test Methods

The evaluation items and the test methods are the same as those described in the specification of this invention.

Result

The results obtained are shown in the following Tables A and B.

Table A

	Example	Comparative Examples		
	2	A	B	C
	Example 2 of the present invention	Example 1 of Scholl et al.	Example 4 of Scholl et al.	Example 5 of Scholl et al.
Silane compound having sulfur atom	SE2	A	B	C
purity (%)	84.2	83.4	80.9	80.5
amount (phr)	6.6	7.0	7.2	7.5
Mooney viscosity (ML1+4)	87	116	110	104
Mooney scorch time	100	72	73	75
Hardness	100	101	103	104
Properties at break				
· elongation at break (Eb)	106	88	87	85
· strength at break (Tb)	108	85	85	87
· tensile stress at 300% elongation	101	116	117	118
Resilience	107	106	108	110
Abrasion resistance	103	84	85	87

Note

SE2: The compound of Synthesis Example 2 of the present invention.

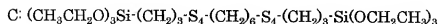
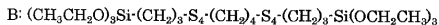
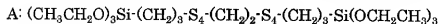
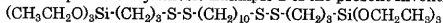
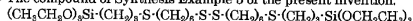


Table B

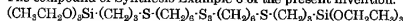
	Examples			Comparative Examples		
	5	6	7	D	E	F
	Example 5 of the present invention	Example 6 of the present invention	Example 7 of the present invention	Example 2 of Scholl et al.	Example 6 of Scholl et al.	Example 7 of Scholl et al.
Silane compound having sulfur atom	SE5	SE6	SE8	D	E	F
purity (%)	85.7	84.9	82.9	82.4	81.0	80.4
amount (phr)	7.2	7.5	8.2	8.5	9.6	9.1
Mooney viscosity (ML1+4)	104	105	102	117	114	121
Mooney scorch time	95	94	98	70	73	73
Hardness	104	108	101	112	110	110
Properties at break						
· elongation at break (Eb)	95	88	105	78	79	77
· strength at break (Tb)	98	98	103	87	85	82
· tensile stress at 300% elongation	105	120	101	119	118	116
Resilience	112	112	110	111	110	109
Abrasion resistance	109	109	108	81	83	83

Note

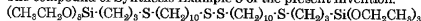
SE5: The compound of Synthesis Example 5 of the present invention.



SE6: The compound of Synthesis Example 6 of the present invention.



SE8: The compound of Synthesis Example 8 of the present invention.

D: $(\text{CH}_3\text{CH}_2\text{O})_3\text{Si}-(\text{CH}_2)_6\text{S}_4-(\text{CH}_2)_2\text{S}_4-(\text{CH}_2)_2\text{S}_4-(\text{CH}_2)_3\text{Si}(\text{OCH}_2\text{CH}_3)_3$ E: $(\text{CH}_3\text{CH}_2\text{O})_3\text{Si}-(\text{CH}_2)_2\text{S}_4-(\text{CH}_2)_6\text{S}_4-(\text{CH}_2)_6\text{S}_4-(\text{CH}_2)_3\text{Si}(\text{OCH}_2\text{CH}_3)_3$ F: $(\text{CH}_3\text{CH}_2\text{O})_3\text{Si}-(\text{CH}_2)_3\text{S}-(\text{CH}_2\text{CHOHCH}_2)\text{S}_4-(\text{CH}_2\text{CHOHCH}_2)\text{S}_4-(\text{CH}_2)_3\text{Si}(\text{OCH}_2\text{CH}_3)_3$

4. I declare further that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Date: 2009/7/1

By: Noriaki Yukimura
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